EXPRESS MAIL NO.: EV170140427US

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IN THE MATTER of United States Patent Application No. 10/015518 in the name of **Ian James Rickards**

11/1/02

STATUTORY DECLARATION

I, **Ian James Rickards**, of 13 Renshaw Drive, Eltham, Australia do solemnly and sincerely declare as follows:

1. I am the inventor in respect of the invention which is the subject of United States Patent Application No. 10/015,518 (hereafter referred to as "the US application") which is a continuation of United States Patent Application No. 09/269,003. I have reviewed the specification of the US application in detail and I am well aware of the scope of the claims of the US application. I have also reviewed the examination report which has issued in relation to the US application and the documents cited by the Examiner in that report.

2. I make the following comments on the basis of my understanding of the US application, including the claims of the US application, the invention and the documents cited by the Examiner in the examination report issued in respect of the US application.

3. As background, the present invention relates to methods for the compaction of a mat of hot mix asphalt and a compactor for use in such a method which are devised to take advantage of characteristics of the hot mix asphalt which have not been recognised in the past. Particularly, in the past methods of compaction and compacting apparatuses short periods of compaction have been used with high compression or pressure values in the thought that this forces the materials of the asphalt into close contact enhancing compaction of the asphalt mix. That is, the compaction was conducted to force the aggregates of the asphalt mix into close contact using short compaction periods and high pressures.

4. The present invention has advantageously realised that the asphalt mix is a visco-elastic material comprising aggregate air and bituminous binder. It is known that the asphalt mix will under short periods of compaction loading under high pressure act more as an elastic material and exhibit rebound due to the nature of the asphalt mix components. Thus the invention realises that in order to obtain good compaction what is required is consideration of the viscous components of the mix and the establishment of compaction conditions that will facilitate the fluid flow of the viscous components i.e. the bituminous binder and air through the aggregate structure. The invention claims that this requires only a moderate head of pressure but a longer load duration or compaction time. This is contrary to the prior art which teaches relatively much shorter compaction times under high load stress.

5. With the above in mind I turn to the citations which have been raised by the Examiner in the examination report and provide my comments on what I believe to be a misinterpretation of the citations by the Examiner.

6. The first rejection raised by the Examiner relates to Ciraud (WO 87/07921) in view of Halim (US Patent No. 4,737,050).

7. Firstly, I note that Ciraud in fact relates to an apparatus and method which is used solely for progressively forming of a concrete and similar surface and does not provide any compaction of the mat which is being laid. The nature of a cementitious material is typically that of a low viscosity fluid which will compact under gravity and Ciraud refers to this in terms of products able to be "poured" from a hopper. This would be clear to those in the art given the apparatus which is illustrated and the inherent lack of load of that apparatus on the mat being laid. As such, the statement by the Examiner that Ciraud discloses "a compactor" is incorrect and indeed the apparatus described in Ciraud would not be appropriate for the compaction of an asphalt surface as suggested by the Examiner. Certainly, on reading Halim, which discloses a compactor which includes a belt for compaction, I believe that it would not be obvious to one of ordinary skill in the art to employ the apparatus of Ciraud for compaction of a hot asphalt mix. As stated above, the apparatus of Ciraud would be readily appreciated by those in the art to be entirely

inappropriate for this purpose.

8. So far as the point on duration and load is concerned as mentioned by the Examiner in this first main objection, as stated above it would be clear to those of ordinary skill in the art that Ciraud does not provide for a load which would be appropriate for the compaction of a hot asphalt mix. As such, I disagree that the loads and durations which are defined in the claims of the US application could be easily arrived at or obvious to one of ordinary skill in the art.

9. The Examiner has also made mention of "limitations of spacing, connection to, and control". Although it is not clear to be which claim of the US application the Examiner is referring to, I again state that the apparatus of Ciraud is not an apparatus for use in compaction and would certainly not be appropriate for the compaction of a hot asphalt mix. As such, I do not see how Ciraud can be considered relevant to the compactor defined in the claims of the US application.

10. On a further point, the Examiner has noted a point on the limitation of heating the belt and has stated that "the limitations would inherently be met when the belt was passed over the surface due to simple heat transfer". This point is incorrect. The limitation of heating the belt prior to compaction is preferably made so that the hot asphalt mix does not adhere to the belt during compaction. If one simply relies on heat transfer during compaction, then there must be at least initially some adherence of the asphalt mix to the belt. That is, the mix will adhere to the belt until the belt is to a satisfactory temperature.

11. Still further, the Examiner has suggested that Ciraud discloses all of the limitations of claims 20, 23 and 24. I strongly disagree with this suggestion. Firstly, Ciraud does not provide for any compaction surface in that it only provides for leveling of the mat and not compaction thereof. Still further, Ciraud in no way provides for two modular compaction units as defined in claim 20, even if one considers the belt of Ciraud to be a compaction surface which I reiterate it is not. Put simply, I fail to see how the Examiner interprets Ciraud to define "two longitudinally spaced modular compaction units" when on my interpretation there is in fact no compaction unit at all.

12. For the above reasoning, I fail to see the relevance of Ciraud in that it does not define "a compactor" such as that defined in the claims of the US application. Furthermore, there is no relationship between the leveling apparatus of Ciraud and the compactor of Halim and so any combination of these two documents would in my mind be inappropriate. Even if the two documents are combined, I believe that the combination falls well short of the invention of the US application.

13. The Examiner then goes on to reject a number of claims over Halim in view of either Jeppson (US Patent No. 4,175,885) or Sandstrom (US Patent No. 4,647,247).

14. Unlike Ciraud, Halim does disclose a compactor which may be used for the compaction of an asphalt mix. The compactor includes a belt which forms a compaction surface. The invention of Halim resides in the belief that the ratio between the stiffness of the compactor to the stiffness of the asphalt should be as low as possible. This is not the same basis for the invention of the current US application which resides in the belief that a low compaction pressure should be applied to the asphalt mix for a longer period of time so as to induce fluid flow throughout the asphalt mix.

15. With regard to the discussion of "overload pressure" put by the Examiner is concerned, intuitively one would think that no compaction is achieved at a pressure which is under the overload pressure of the asphalt mat. That is, pressures in accordance with the present invention are sufficient to induce flow in the critical components (i.e. fluids) and are therefore greater than the overload pressure of the mat. This appears to be a clear misinterpretation of the invention by the Examiner. Furthermore, this is a misinterpretation of the disclosure of Halim by the Examiner.

16. I reiterate that the present invention is formed on the basis that flow must be induced in the binder, particularly flow away from contact points of the aggregate so as to remove entrained air in the asphalt mat. This is not the approach taken in Halim and this is certainly not recognised by Halim in his teachings.

17. The Examiner has clearly stated that Halim provides absolutely no disclosure of the limitations of duration and load as defined in the claims of the US application. However,

the Examiner has suggested that Jeppson and Sandstrom each teach advancing of compactors at very low speeds and that these disclosures would have made it obvious to one of ordinary skill in the art to use the ranges as claimed in the US application in order to properly compact an asphalt mat "as taught by both Sandstrom & Jeppson". I disagree with this statement. More particularly, the present invention provides for an increased time of engagement of any one portion of the mat with the compaction surface or belt and does not relate to a necessarily low advancing compactor speed. That is, it is the contact time with the asphalt mat that is important, not the speed of compaction. The Examiner may believe that these two characteristics are identical, but they are not. In order to more clearly illustrate this, one can simply refer to both Jeppson and Sandstrom which describe compaction of the asphalt surface with rollers, not a belt or compaction surface in accordance with the invention of the US application. One will readily appreciate that if a roller is used to compact the asphalt surface, then only a very small portion of the roller is in contact with the asphalt surface at any one time. Therefore, even though the speed of the compactor may be very low, the time of engagement of the compaction surface of the roller is in fact very short given that the compaction surface in contact with the asphalt mat at any one time is reasonably thin. This is quite distinct to a situation where compaction is conducted with a belt. In the light of this, I firmly believe that Jeppson and Sandstrom provide an illustration that short engagement times with the asphalt mat should be used and that it is unreasonable to suggest that on reading these documents one would consider using the compactor of Halim at low speeds to arrive at the periods of engagement with the mat as defined in the claims of the US application.

18. In short, I believe that Halim fails to recognize, suggest or teach that advantages can be obtained through compaction at low pressures for longer periods of time, in terms of engagement time with the asphalt mat, compared with those conventionally used. The disclosure of Jepson and Sandstrom leads to extremely short engagement times with the asphalt mat and therefore these documents teach away from the present invention even when taken with Halim.

19. The Examiner has taken a final objection to a number of claims on the basis of Moorhead (US Patent 3,832,079) in view of Stowell (US Patent No. 5,215,402). Again, I believe that the Examiner has misinterpreted the disclosure of these two documents and I do not

believe that they can be used to arrive at the present invention. Particularly, both of these documents relate to paving apparatuses which are used for texturizing the paving surface and are not used for compaction in accordance with the present invention.

20. The Examiner appears to be failing to recognise the substantial differences between the paving of concrete and texturizing of paving surfaces and the present invention which relates to the compaction of a hot asphalt mix. I again return to the basis for the invention which resides in the realisation that better compaction of a hot asphalt mix can be achieved, bearing in mind that asphalt includes components of aggregate and binder, by using lower compaction pressures and longer compaction times as this combination results in a fluid flow of the binder through the aggregate. The paving systems disclosed in Moorhead and Stole are therefore completely irrelevant to the presently claimed invention and cannot be considered to render the invention obvious given that they are in an entirely different field of art.

21. In summary, and also taking into account the Examiner's submission that the claims fail to particularly point out and distinctly claim the subject matter which is regarded as the invention, accordingly to the US application there is provided a method and a compactor which advantageously provide for enhanced compaction of a hot asphalt mix. This is achieved in the method by applying a maximum average load stress to the mat of less than about 50 kPa and ensuring that anyone portion of the mat is engaged with the compaction surface of a compactor for a period of at least 1.5 seconds. It is these crucial components which provide for the flow of the binder through the aggregate of the hot asphalt mix. As such, the invention is clearly defined in claim 1 of the US application. The compactor claim of the US application, claim 19, provides for at least two longitudinally spaced modular compaction units. Each of the compaction units comprises a compaction belt and support means which defines a planar lower run of the belt forming compaction surface. The provision of at least two spaced modular compaction units, each of which includes a compaction surface constituted by a planar lower run of a belt ensures that very long engagement times can be achieved with the asphalt mix, again providing the advantageous effect of the present invention.

AND I MAKE this solemn declaration by virtue of the Statutory Declarations Act 1959 as amended and subject to the penalties provided by that Act for the making of false statements in statutory declarations, conscientiously believing the statements contained in this declaration to be true and correct in every particular.

Declared at MELBOURNE in the State of Victoria
this 16th day of SEPTEMBER, 2002

Ian J Rickards

Before me: B. Condon
BILL CONDON (ASCPA)